U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)

4. WBS ELEMENT CODE	5. WBS ELEMENT TITLE
04.11.03.01	Out-year D&D of C-410

6. INDEX LINE NO.	7. REVISION NO. AND AUTHORIZATION	8. DATE
N/A	Rev. 0	06/18/08

9. APPROVED CHANGES
N/A

10. SYSTEM DESIGN DESCRIPTION	11. BUDGET AND REPORTING NUMBER
N/A	N/A

12. ELEMENT TASK DESCRIPTION

THIS IS A PLANNING LEVEL WBS DICTIONARY

WBS STRUCTURE

The scope of this element includes the following subelements:

WBS 04.11.10.02.01	**Sub-Project Management**
WBS 04.11.10.02.02	**Sector 4 Abatement - OY**
WBS 04.11.10.02.03	**Sector 5 Abatement - OY**
WBS 04.11.10.02.04	**Sector 6 Abatement - OY**
WBS 04.11.10.02.05	**Sector 7 Abatement - OY**
WBS 04.11.10.02.06	**Sector 8 Abatement - OY**
WBS 04.11.10.02.08	**Surveillance and Maintenance & Support Activities**
WBS 04.11.10.02.09	**Uranium Hexafluoride (UF6) System Hazard Stabilization**
WBS 04.11.10.02.10	**Ammonia (NH3) System Hazard Stabilization**
WBS 04.11.10.02.11	**Glycol System Hazard Stabilization**
WBS 04.11.10.02.12	**Vacuum System Hazard Stabilization**
WBS 04.11.10.02.13	**Electrolytes System Hazard Stabilization**
WBS 04.11.10.02.14	**Uranium Dioxide (UO2), Uranium Trioxide (UO3), Uranium Tetra fluoride (UF4), & Ash Receiver System Hazard Stabilization**
WBS 04.11.10.02.15	**Heating, Ventilation, and Air Conditioning (HVAC) System**
WBS 04.11.10.02.16	**Non-Stationary Materials/Components Removal**
WBS 04.11.10.02.17	**Alcohol System Stabilization**
WBS 04.11.10.02.18	**Prohibited Items Removal**
WBS 04.11.10.02.19	**Building Decontamination**
WBS 04.11.10.02.20	**Prepare Building for Demolition**
WBS 04.11.10.02.21	**Building Demolition**
WBS 04.11.10.02.22	**Post Demolition Activities**

INTRODUCTION

The purpose of the Decontamination and Decommissioning (D&D) project is to plan and implement the decontamination, decommissioning, infrastructure removal, and required waste management activities associated with the C-410/420 Complex at the Paducah Gaseous Diffusion Plant (PGDP). Materials

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

generated as a result of the D&D will be dispositioned either through reuse or appropriate disposal pathways. C-410 is inactive and infrastructure removal work is ongoing in accordance with the approved Removal Action Work Plan (RAWP). The facility has been subdivided into sectors and zones to facilitate efficient disposition. Known contaminants include low enriched uranium, transuranics, technicium-99, beryllium dust, asbestos, and polychlorinated biphenyls (PCBs) in paint and potentially in switchgear components. Some systems are known to contain holdup material that will be rendered passive for deactivation prior to component/piping removal. The potential that additional chemical and radiological hazards will be identified during infrastructure removal exists. The facility is a Category 2 nuclear facility with an approved safety basis authorization for infrastructure removal activities.

The C-410 Complex is made up of three primary facilities, all of which are physically connected. The C-410 Building, with the east and west expansions, covers 129,000 square feet, and was used primarily for the conversion of uranium oxides to uranium hexafluoride and for the generation of fluorine. The C-420 Building is a four-story facility, with over 46,000 square feet of floor area. The C-420 Facility was used to convert uranium oxides to uranium tetrafluoride. The C-411 Building is a single story facility, consisting of approximately 6,000 square feet that was utilized for maintenance of fluorine generating cells and equipment.

In addition to the primary building, the C-410 Complex includes the C-410-I Facility, a 2000 square foot structural steel facility with roof and open walls and the C-410-C Limehouse, an 1100 square foot steel frame building with corrugated roof and walls, originally used for neutralization of fluorine cell electrolyte, and most recently used for removal of paint from fluorine cells. The Complex also includes the footprints and concrete foundations of the former C-410-F, G, H, and I Hydrogen Fluoride facilities. The tanks, structures, and piping from these facilities have been demolished and dispositioned, leaving only the concrete perimeter foundations in place.

Figure 1 shows the footprint of the C-410 Complex. Previous projects have completed the demolition of infrastructure in Sector 1 of the facility, and converted the western portion of Sector 1 (Zone 21) and Zone 19 of Sector 7 into a Boundary Control Station and dress out area for personnel working inside the facility. Further, previous projects have completed accessible asbestos abatement in Sectors 1 through 8, and completed stabilization and removal of fluorine (F_2) system, hydrogen (H_2), and hydrogen fluoride (HF) systems. Non-stationary items remaining in the facility, defined as items that are not physically installed or connected physically to the structure, were characterized for disposition under a previous activity.

1. PROJECT TITLE/PARTICIPANT Environmental Management/Paducah Remediation Services, LLC (PRS)	2. DATE 6/18/08	3. IDENTIFICATION SITE Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE 04.11.03.01	5. WBS ELEMENT TITLE Out-year D&D of C-410	

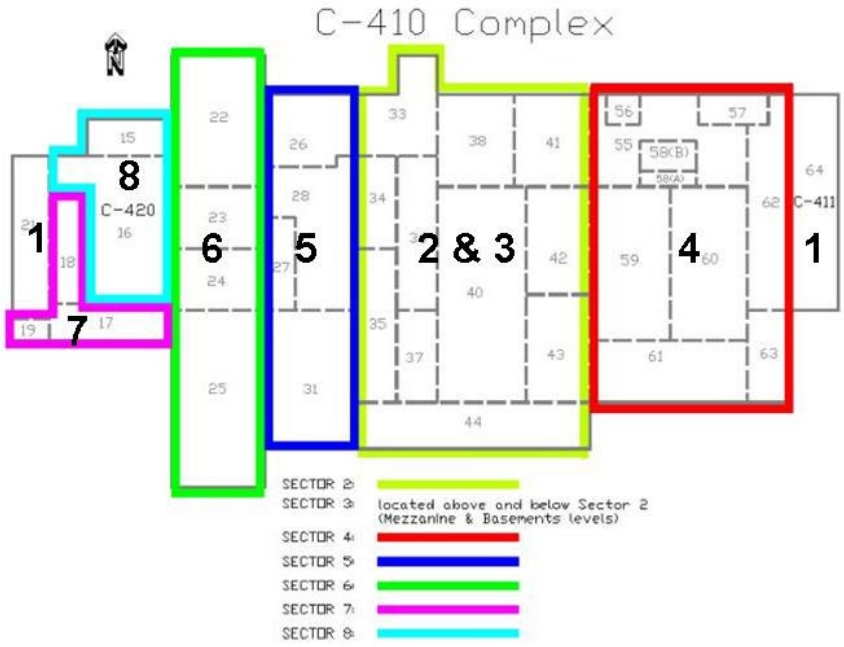

Figure 1. Footprint of the C-410 Complex.

The activities defined in this WBS will include:

- Completing the hazardous material stabilization of chemical systems within the facility.
- Disposal of components, residual material, and any secondary waste generated during the stabilization efforts.
- The following table provides an overview of the specific systems that will require stabilization under this WBS Element, and the Sectors of the facility where each system is present. No systems are present in Sector 1. A "C" in the following table indicates the systems were removed as a part of the previous WBS Element, while an "X" indicates the system will be removed as a part of this element. "NA" indicates that the system is not present in this zone.

System	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8
UF6	X	X	NA	X	X	NA	
HF	C	C	C	C	C	C	C
F2	C	C	C	C	C	C	C

1. PROJECT TITLE/PARTICIPANT Environmental Management/Paducah Remediation Services, LLC (PRS)	2. DATE 6/18/08	3. IDENTIFICATION SITE Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE 04.11.03.01	5. WBS ELEMENT TITLE Out-year D&D of C-410	

H2	NA	NA	C	NA	NA	NA	C
NH3	X	NA	NA	NA	NA	NA	NA
Glycol	NA	NA	NA	X	X	NA	NA
Vacuum	X	X	X	X	X	X	X
Freon	X	NA	NA	NA	NA	NA	NA
Electrolyte	NA	X	X	NA	NA	NA	NA
Alcohol	X	X	NA	NA	NA	NA	NA
Uranium Powder (U02,U03,UF4, Ash Receivers)	NA	NA	NA	X	X	X	X
HVAC	X	X	X	X	X	X	X

- Removing and disposing of non-stationary items (loose material) that cannot be left in place and removed and dispositioned during the building demolition.
- Removing and disposal of RCRA/TSCA regulated debris (prohibited items) from installed equipment. Prohibited items are those items, such as fuses, light ballasts, capacitors, and other items that would prevent building demolition debris and remaining in place components from meeting an LLW disposal facility Waste Acceptance Criteria.
- Building structure/remaining equipment gross decontamination
- Preparation for demolition
- Building Demolition
- Disposition of demolition debris.

The end state for the C-410 Complex, following completion of work defined in this WBS, is as follows:

- C-410 Complex will be demolished to slab.
- Basements, foundations, and subgrade structures will remain in place.
- Pits, sumps, basements, and depressions will be filled to grade with flowable fill or other suitable material.
- Transferrable contamination will be decontaminated from slabs; fixed contamination will be encapsulated in place.
- Access controls (fencing, chains, etc) will be established for entire slab area. Additionally, elevated loading docks or other elevated concrete floors from original building will be protected to prevent fall hazards.
- Demolition debris will be dispositioned.

For CERCLA actions, the appropriate FFA/CERCLA documentation will be required which will include SAP, QAP, WMP, H&S Plan, and other documents, as applicable to the action. These documents may require Regulatory approval.

LOGIC RELATIONSHIPS

Interfaces:

Internal to Contractor

- All Contractor project managers and staff
- All subcontractors

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

External to Contractor

- U.S. Department of Energy (DOE) Portsmouth/Paducah Project Office and support contractors
- DOE Headquarters (HQ) or other DOE Sites (if applicable)
- Environmental Protection Agency (EPA)
- Commonwealth of Kentucky (KY)
- Site tenants including United States Enrichment Corporation (USEC); Uranium Disposition Services, LLC; and Swift and Staley Team (SST)
- USEC services in the area of property, information technology, radios, etc.
- SST, particularly in the areas of property management, information technology, and security.
- Nevada Test Site (NTS): Profiling and disposition of newly generated and classified and fissile low-level waste (LLW), if required or applicable.
- Energy*Solutions*: Profiling, treatment, and disposition of mixed and LLW, if required or applicable.
- TSCA Incinerator disposal of PCB and radioactive liquids.
- Commercial Treatment Storage and Disposal (TSD) Facility: For treatment and disposal of nonradioactive hazardous waste, if required or applicable.
- Stakeholders
- Citizens Advisory Board and supporting contractor Edward Holmes Incorporated (EHI).
- DOE Integrated Safety Management System (ISMS) Verification Team
- Other nonregulatory key interfaces

Time Sequencing with Other Work:

- Per the FFA and Site Management Plan, the D&D of the C-410 Complex is to be completed by September 30, 2012.
- The Engineering Evaluation/Cost Analysis (EE/CA), Action Memorandum (AM) and Removal Action Work Plan (RAWP) for the facility structure demolition must be completed prior to building demolition.
- Existing documentation covers only the removal of infrastructure (stored material, equipment, piping, ductwork, etc).
- SWMU schedules will be driven by the master facility inspection schedules and the compliance deliverables from the environmental compliance database.
- Asbestos abatement, hazard stabilization and prohibited items removal must be completed before Building Demolition can begin.
- Loose material (stored items located in the C-410 Building) that cannot be dispositioned during with building demolition debris will be removed prior to the start of building demolition.
- First activity necessary for work in a Sector will be the installation of temporary power and lighting, and the demarcation of hazards.
- Crane renovation and recertification will be required in Sectors 5, 6, and 8 before commencing removal of large equipment for stabilization.
- Non-Destructive Assay evaluation of systems containing hold up may be performed prior to passivation activities to identify areas of significant radioactive contamination loading.
- Construction of a passivation structure may be required prior to stabilization of Cold Traps in Sectors 5 and 6.
- The expected sequence of work for D&D activities in each Sector will include verification that equipment is de-energized, followed by asbestos abatement, followed by hazardous material removal (passivation), preparation for building demolition, and building demolition.
- The Documented Safety Analysis and Technical Safety Requirements will require revision as a part of preparation for building demolition, as current documentation does not allow for demolition.
- In general, entire systems will be stabilized at one time, with the most hazardous (UF6) being first

priority. However, the specific sequencing may vary based on available resources and accessibility in specific areas.

- Following completion of stabilization, asbestos insulation that was not accessible due to location of systems containing hazardous materials will be removed to extent needed to support demolition.
- Stabilization and Prohibited Items removal must be completed in an area of the building prior to performing Building Decontamination and Demolition Preparation in that area.
- Waste disposition will be performed throughout the project. With the exception of small quantities of waste held until adequate quantities are available for shipment, waste will be dispositioned as characterized.

SCOPE DESCRIPTION

WBS 04.11.10.02.01 D&D of C-410 Subproject Management

Provide overall management activities associated with this subproject. Activities performed under this subelement include the following:

- Perform technical, contractual and project functions necessary to effectively manage and report scope, schedule, and budget;
- Maintain all activities within the defined safety, environmental, and quality requirements;
- Perform technical and personnel management functions;
- Maintain technically qualified and properly trained personnel;
- Develop, evaluate, and report project performance metrics; and
- Interface with DOE, KY, EPA, other prime contractors, and stakeholders, as needed.
- Preparation of a Removal Action Completion Report for the C-410 Complex Removal Actions.

The method(s) used for determining earned value for this WBS element is Level of Effort.

WBS 04.11.10.02.02 Sector 4 Abatement – OY

Perform all necessary activities to abate asbestos from Sector 4 of the C-410 Complex, in compliance with substantive requirements of Commonwealth of Kentucky regulations for demolition projects. This includes removal of thermal surfacing insulation from piping and vessels, ductwork, and equipment; removal of transite or other asbestos interior wall panels and cable trays; asbestos insulation piping muds or mastics, and other friable asbestos requiring removal prior to facility stabilization or demolition.

Debris, including the asbestos, and any associated wastes generated during the abatement, shall be dispositioned in accordance with appropriate State and Federal Regulations and DOE Orders.

Removal of asbestos insulated electrical wire is not required as a part of this activity, as the conduit and electrical wire can be removed during the building demolition using demolition techniques.

The end state for the asbestos abatement task is that over 90% of the asbestos to be removed from the facility, and exposed piping and equipment ready for stabilization or removal. It is expected that approximately 10% of the asbestos will be inaccessible due to location, interferences from equipment or piping requiring passivation, etc., based on experience from Sectors 2 and 3 abatement activities to date. Following hazard stabilization and necessary component removal (when remaining asbestos is accessible), remaining asbestos will be removed if required to perform demolition safely and to comply with demolition regulations. Temporary Power and lighting will be left in place throughout the building, for supporting next phases of activity, and the Portable Criticality Accident Alarm System will remain in place. Asbestos containment structures will be demolished, and removed asbestos and debris from

containments will be disposed. Exterior transite walls will remain in place.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.03 Sector 5 Abatement – OY

Perform all necessary activities to abate asbestos from Sector 5 of the C-410 Complex, in compliance with substantive requirements of Commonwealth of Kentucky regulations for demolition projects. This includes removal of thermal surfacing insulation from piping and vessels, ductwork, and equipment; removal of transite or other asbestos interior wall panels and cable trays; asbestos insulation piping muds or mastics, and other friable asbestos requiring removal prior to facility stabilization or demolition.

Debris, including the asbestos, and any associated wastes generated during the abatement, shall be dispositioned in accordance with appropriate State and Federal Regulations and DOE Orders.

Removal of asbestos insulated electrical wire is not required as a part of this activity, as the conduit and electrical wire can be removed during the building demolition using demolition techniques.

The end state for the asbestos abatement task is that over 90% of the asbestos to be removed from the facility, and exposed piping and equipment ready for stabilization or removal. It is expected that approximately 10% of the asbestos will be inaccessible due to location, interferences from equipment or piping requiring passivation, etc., based on experience from Sectors 2 and 3 abatement activities to date. Following hazard stabilization and necessary component removal (when remaining asbestos is accessible), remaining asbestos will be removed if required to perform demolition safely and to comply with demolition regulations. Temporary Power and lighting will be left in place throughout the building, for supporting next phases of activity. Asbestos containment structures will be demolished, and removed asbestos and debris from containments will be disposed. Exterior transite walls will remain in place.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.04 Sector 6 Abatement – OY

Perform all necessary activities to abate asbestos from Sector 6 of the C-410 Complex, in compliance with substantive requirements of Commonwealth of Kentucky regulations for demolition projects. This includes removal of thermal surfacing insulation from piping and vessels, ductwork, and equipment; removal of transite or other asbestos interior wall panels and cable trays; asbestos insulation piping muds or mastics, and other friable asbestos requiring removal prior to facility stabilization or demolition.

Debris, including the asbestos, and any associated wastes generated during the abatement, shall be dispositioned in accordance with appropriate State and Federal Regulations and DOE Orders.

Removal of asbestos insulated electrical wire is not required as a part of this activity, as the conduit and electrical wire can be removed during the building demolition using demolition techniques.

The end state for the asbestos abatement task is that over 90% of the asbestos to be removed from the facility, and exposed piping and equipment ready for stabilization or removal. It is expected that approximately 10% of the asbestos will be inaccessible due to location, interferences from equipment

or piping requiring passivation, etc., based on experience from Sectors 2 and 3 abatement activities to date. Following hazard stabilization and necessary component removal (when remaining asbestos is accessible), remaining asbestos will be removed if required to perform demolition safely and to comply with demolition regulations. Temporary Power and lighting will be left in place throughout the building, for supporting next phases of activity. Asbestos containment structures will be demolished, and removed asbestos and debris from containments will be disposed. Exterior transite walls will remain in place.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.05 Sector 7 Abatement – OY

Perform all necessary activities to abate asbestos from Sector 7 of the C-410 Complex, in compliance with substantive requirements of Commonwealth of Kentucky regulations for demolition projects. This includes removal of thermal surfacing insulation from piping and vessels, ductwork, and equipment; removal of transite or other asbestos interior wall panels and cable trays; asbestos insulation piping muds or mastics, and other friable asbestos requiring removal prior to facility stabilization or demolition.

Debris, including the asbestos, and any associated wastes generated during the abatement, shall be dispositioned in accordance with appropriate State and Federal Regulations and DOE Orders.

Removal of asbestos insulated electrical wire is not required as a part of this activity, as the conduit and electrical wire can be removed during the building demolition using demolition techniques.

The end state for the asbestos abatement task is that over 90% of the asbestos to be removed from the facility, and exposed piping and equipment ready for stabilization or removal. It is expected that approximately 10% of the asbestos will be inaccessible due to location, interferences from equipment or piping requiring passivation, etc., based on experience from Sectors 2 and 3 abatement activities to date. Following hazard stabilization and necessary component removal (when remaining asbestos is accessible), remaining asbestos will be removed if required to perform demolition safely and to comply with demolition regulations. Temporary Power and lighting will be left in place throughout the building, for supporting next phases of activity. Asbestos containment structures will be demolished, and removed asbestos and debris from containments will be disposed. Exterior transite walls will remain in place.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.06 Sector 8 Abatement - OY

Perform all necessary activities to abate asbestos from Sector 8 of the C-410 Complex, in compliance with substantive requirements of Commonwealth of Kentucky regulations for demolition projects. This includes removal of thermal surfacing insulation from piping and vessels, ductwork, and equipment; removal of transite or other asbestos interior wall panels and cable trays; asbestos insulation piping muds or mastics, and other friable asbestos requiring removal prior to facility stabilization or demolition.

Debris, including the asbestos, and any associated wastes generated during the abatement, shall be dispositioned in accordance with appropriate State and Federal Regulations and DOE Orders.

Removal of asbestos insulated electrical wire is not required as a part of this activity, as the conduit and electrical wire can be removed during the building demolition using demolition techniques.

The end state for the asbestos abatement task is that over 90% of the asbestos to be removed from the facility, and exposed piping and equipment ready for stabilization or removal. It is expected that approximately 10% of the asbestos will be inaccessible due to location, interferences from equipment or piping requiring passivation, etc., based on experience from Sectors 2 and 3 abatement activities to date. Following hazard stabilization and necessary component removal (when remaining asbestos is accessible), remaining asbestos will be removed if required to perform demolition safely and to comply with demolition regulations. Temporary Power and lighting will be left in place throughout the building, for supporting next phases of activity. Asbestos containment structures will be demolished, and removed asbestos and debris from containments will be disposed. Exterior transite walls will remain in place.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.08 Surveillance, Maintenance and Support Activities

Performance of all surveillance and monitoring activities associated with the C410 Complex will be completed under this element. This will include, but not be limited to, routine inspections, rodent and pest control, and minor facility repairs. Additionally, this element includes performing routine daily, quarterly, and annual surveillances of the PCAAS System, required by the Technical Safety Requirements for the facility, is included in this element. Staffing of the of the radiological Boundary Control Station (maintenance of ½ body monitors, provision of radiological control technicians to support building entry and exit, hanging of monitoring pumps, routine surveys, etc) is included in this element.

Management of a warehouse for receipt, storage, and distribution of consumables, equipment, tools, and materials necessary to support the C-410 Complex D&D Project will be included in the S&M activity. Lease and maintenance of vehicles for transportation of personnel and for movement of materials and equipment, and lease of rental equipment is also included.

The method(s) used for determining earned value for this WBS element is Level of Effort for Surveillance and Maintenance and support activities.

WBS 04.11.10.02.09 Uranium Hexafluoride (UF6) System Hazard Stabilization

Uranium Hexafluoride (UF6) systems require stabilization in Sectors 2, 3, 5, and 6 as a part of this WBS Element. These systems include both piping and installed UF6 cold traps (Modine Traps or Alco type traps), and this stabilization will also include 4 Alco Traps that did not originate in the C-410 Complex, as well as a spare Modine Trap and process valves currently in storage. The 4 traps were brought in from another facility. Stabilization will be performed by passing wet air through the piping and equipment in a controlled manner, with pollution control devices (e.g. HF Capable NAM's) capturing any HF generated during the process. Piping and equipment will be removed and disposed, based on experience gained in characterization of piping and residuals from completed UF6 piping stabilization efforts.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.10 Ammonia (NH3) System Hazard Stabilization

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

Ammonia (NH3) was used as a refrigerant system in C-410. The compressors, piping, coolers, and associated equipment are located in Sector 2. These systems will be purged to ensure that no residual ammonia remains in the piping or equipment. The equipment will and piping will remain in place for removal as a part of building demolition.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.11 Glycol System Hazard Stabilization

Ethylene Glycol was used as a heat transfer fluid in the C-410 building. Piping, storage tanks, and other equipment for this system are located in Sectors 5 and 6. The equipment will be purged to ensure no ethylene glycol remains in any of the systems, and the equipment, tanks and piping will remain in place for removal as a part of building demolition.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.12 Vacuum System Hazard Stabilization

The C-410 Facility included a vacuum system, located in multiple Sectors (2 through 8) throughout the facility. This system was used, among other purposes, for clean up of uranium powder and other materials spilled throughout the facility and for equipment clean out. Residual uranium powders will be removed from the systems using air sweeping to remove particles and loose materials, and the piping, filters, and vacuum equipment will be removed as a part of stabilization.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.13 Electrolytes System Hazard Stabilization

As a part of the production of fluorine in C-410, an electrolyte solution was dissociated by use of electrical current in fluorine generation cells, resulting in generation of fluorine and hydrogen. The electrolyte used for production of the HF was produced in C-410, and piping and storage tanks for this material were used for storage and distribution of the electrolyte material.

The electrolyte material is a solid at room temperature, and from knowledge gained in Zone 42 and 43 stabilization and D&D activities, remains as a residual in piping and equipment. Presence of this residual would preclude removal and disposition of the electrolyte piping and equipment during building demolition. If solid electrolyte is present it requires removal prior to building demolition due to the elevated levels TCLP metals.

Based on this experience, the piping will be purged using HF capable NAMs or similar control devices, to remove any potential HF vapors remaining in the systems. Following purging, the piping and equipment will be removed for disposition.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.14 Uranium Dioxide (UO2), Uranium Trioxide (UO3), Uranium Tetra fluoride (UF4) & Ash Receiver System Hazard Stabilization

Uranium entered the process at the C-410 Complex primarily as uranium oxides in a powder form, which were converted into UF4 powder. The UF4 was then converted to gaseous UF6. A series of hoppers,

reactors, conveyers, feed screws, and other powder or solid material handling was utilized in the powder handling operations. The oxide handling systems are located in Sectors 5, 6, 7, and 8 of the C-410 Complex. Any remaining uranium powder and residues will require removal as a part of the stabilization effort. The uranium compounds in this part of the UF6 production process are pure chemical compounds and are subject to the source material exclusion. The equipment will be removed, or decontaminated and fixative applied. If left in place, it will be removed and disposed as a part of building demolition.

Uranium powder or contaminants in the uranium which did not fully fluorinate or were non volatile were collected in ash receivers at the bottom of the UF6 producing fluorination towers. This WBS Element will also address the ash receivers and associated equipment.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.15 HVAC System Hazard Stabilization

The process areas in the C-410 Complex included ventilation systems, consisting of large duct work and air movers. The ductwork systems will be inspected and/or sampled to determine presence of removal radioactive materials and PCBs from the ductwork. Removable materials will be captured by vacuuming or other removal techniques. The ductwork will be removed, if necessary based on sampling results, under negative pressure or following application of fixative to control dust. It is estimated that 50% of ductwork will contain radiological contamination levels such that removal during this WBS Element will be required. Remaining 50% of ductwork is estimated to not contain loose radiological material or other deposits, and will be left in place for demolition with the building.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

04.11.10.02.16 Non-Stationary Materials/Components Removal

At the beginning of activities under this WBS Element, approximately 40000 cubic feet of material that is not installed or connected to the C-410 Complex are present in the C-410 Complex, or staged in the area surrounding the C-410 Complex. This material resulted from past storage in the facility, spare parts or equipment that was used in the production activities and remained at time D&D activities began, or resulted from previous stabilization or removal efforts. Activities under WBS Element 04.11.03.01.06 collected necessary data to characterize this material.

Under this WBS Element, this material will be packaged, and disposed in accordance with applicable regulations.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.17 Alcohol System Stabilization

Alcohol was used as a heat transfer fluid to cool the Alco tertiary UF6 traps in the C-410 Complex. Alcohol was present on the tube side of the tube and shell type condensers/traps. The system included piping, coolers, and tanks, as well as the traps. The traps are being addressed as part of WBS Element 04.11.10.02.09. Alcohol will be removed from the system, and piping, tanks, and coolers will be left in place for removal as a part of building demolition.

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

WBS 04.11.10.02.18 Prohibited Items Removal

Installed equipment in the C-410 Complex includes items which require removal prior to building demolition. The items are generally prohibited from disposal by the waste acceptance criteria for low-level waste or sanitary landfills. Examples of these items include liquid mercury containing electrical components or mercury switches; PCB oil from transformers, door closers, hydraulic oil systems, or capacitors; and RCRA components such as fuses or light bulbs.

These prohibited items will be removed from installed equipment, packaged, and disposed as a part of this WBS Element.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.19 Building Decontamination

Upon completion of building stabilization efforts, a gross decontamination of structure and remaining installed equipment and piping will be performed. This decontamination will include surveying to determine levels of radiological contamination; paint chip removal; gross vacuuming; hot spot decontamination in areas of high radiological or significant transferable contamination; application of fixatives to contain/secure contamination from release during the demolition phase. The fixative application also prevents rainwater from coming into contact with contaminated surfaces when precipitation events occur after transite removed and during demolition process. Decontamination efforts will proceed in a phased fashion, preceding preparation for demolition and demolition activities.

04.11.10.02.20 Prepare Building for Demolition

Necessary activities will be undertaken during this element to prepare the C-410 Complex for demolition. Activities planned during this element include, but are not limited to, establishing run off controls; removing temporary power in the C-410 Building; dismantling the PCAAS; removing exterior transite panels; dismantling the Boundary Control Station and removing ½ body monitors; and final verification that all original power and utilities are air gapped and de-energized. Equipment and piping though out the building will be prepared for removal (e.g., mounting bolts for large pieces of equipment may be cut or removed or shafts disconnected between pumps and motors to facilitate removal of these items prior to building demolition). Transite siding will be removed from walls of facility. Construction power will be disconnected and high value items or items to be used in future D&D activities will be removed for future use. The switchgear located on the Southwest side of the facility will require disconnection from USEC Power Grid.

Additionally, a revision of the facility safety basis is required to be completed to allow building demolition. The current safety basis does not include demolition of the facility, and based on inventory, results in categorization as a Category 2 Nuclear Facility. Following completion of hazard stabilization, which will accomplish removal of the radionuclide inventory on which this categorization is derived, the Facility Categorization will be re-evaluated, and should be established as a radiological facility.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.21 Building Demolition

During this element, the C-410 Structure and auxiliary facilities will be demolished to slab. The auxiliary facilities include the C-410-I Ash Receiver Shelter and the C-410-C Limehouse facility, as well as pipe

chases and heated housings that enter the facility. The demolition will include the structural elements and non-hazardous piping and equipment left in place.

Demolition will be accomplished using high-reach demolition equipment (e.g. trackhoes with second or third member shears or similar material processors). Large beams and the metal floor plates for mezzanines or larger equipment platforms will require torch cutting or precutting prior to removal with the heavy equipment. Equipment used during the demolition and for debris handling will be mobilized to the site; site controls will be established, and the demolition will be performed. Demolition debris will be packaged and removed from the site for transportation and disposal.

As a part of demobilization, demolition equipment and material handling equipment will be surveyed and decontaminated following completion of demolition and waste loading activities for release.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

WBS 04.11.10.02.22 Post Demolition Activities

Flowable fill or other suitable backfill materials will be placed in subgrade pits or subbasements. Removable contamination on the building slab will be decontaminated if practicable using normal decontamination techniques (washing, scrubbing, wiping, vacuuming, etc). Aggressive techniques such as scarification will be considered for localized areas if such techniques can be applied and reduce waste disposition costs through reduction of waste volumes requiring disposition as low-level waste. Fixatives or encapsulants will be applied as required to protect surfaces and prevent future releases of contamination. Access controls, such as postings, fences, or radiological posting (ropes or chains) will be established as required.

Backfilling of pits and below grade areas may be completed prior to structural demolition to provide working surfaces, prevent water infiltration during demolition, and to provide structural stability to slabs over basements to support demolition activities. Lessons learned from other facilities (ETTP) indicate filling of recessed areas prior to transite removal and building demolition will prevent water infiltration into the pits or basements.

Develop removal action completion report to document completion of the C-410 Complex D&D activities.

The method(s) used for determining earned value for this WBS element is Actual unit completion.

DELIVERABLES

WBS 04.11.10.02.01 D&D of C-410 Subproject Management

Element Milestones:

- None

Element Deliverables:

- Paducah Contractor Quality Assurance (QA) Project Plan
- Paducah Contractor Environmental, Safety, and Health (ES&H) Plan
- Provide input to the following reports and submittals (if applicable):
  - Monthly Project Performance Report (PPR)
  - Risk Management Plan Updates
  - Site Management Plan (SMP)

- Semiannual Critical Analysis Report
- Presentations
- FFA briefings
- Labor Standards Determinations
- Gold Chart Performance Metrics
- Annual updates to STP
- Annual Compliance Agreement Report
- Annual ISMS Update
- Annual Work Smart Standards Update
- Financial Reporting, Management Analysis Reporting System
- Annual Statement of Costs Incurred and Claimed
- FFA Semiannual Progress Report
- Remedial Action/Regulatory Commitment Tracking Report
- Other reports/documents, as necessary

WBS 04.11.10.02.02 Sector 4 Abatement – OY

Element Milestones
- Complete Asbestos Abatement in Sector 4 by 9/30/10.

Element Deliverables
- Develop work control documents to perform asbestos abatement activities.
- Complete asbestos abatement from Sector 4 of the C-410 Complex.
- Complete disposition of waste materials generated during asbestos abatement
- Provide required notifications to the Commonwealth of Kentucky for asbestos abatement activities

WBS 04.11.10.02.03 Sector 5 Abatement – OY

Element Milestones
- Complete Asbestos Abatement in Sectors 5 by 5/30/2010

Element Deliverables
- Develop work control documents to perform asbestos abatement activities.
- Complete asbestos abatement from Sector 5 of the C-410 Complex.
- Complete disposition of waste materials generated during asbestos abatement
- Provide required notifications to the Commonwealth of Kentucky for asbestos abatement activities

WBS 04.11.10.02.04 Sector 6 Abatement – OY

Element Milestones
- Complete Asbestos Abatement in Sectors 6 by 8/31/2010

Element Deliverables
- Develop work control documents to perform asbestos abatement activities.
- Complete asbestos abatement from Sector 6 of the C-410 Complex.
- Complete disposition of waste materials generated during asbestos abatement
- Provide required notifications to the Commonwealth of Kentucky for asbestos abatement activities

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

WBS 04.11.10.02.05 Sector 7 Abatement – OY

Element Milestones
- Complete Asbestos Abatement in Sectors 4 - 8 by 5/30/2010

Element Deliverables
- Develop work control documents to perform asbestos abatement activities.
- Complete asbestos abatement from Sector 7 of the C-410 Complex.
- Complete disposition of waste materials generated during asbestos abatement
- Provide required notifications to the Commonwealth of Kentucky for asbestos abatement activities

WBS 04.11.10.02.06 Sector 8 Abatement - OY

Element Milestones
- Complete Asbestos Abatement in Sectors 4 - 8 by 9/30/2010

Element Deliverables
- Develop work control documents to perform asbestos abatement activities.
- Complete asbestos abatement from Sector 5 of the C-410 Complex.
- Complete disposition of waste materials generated during asbestos abatement
- Provide required notifications to the Commonwealth of Kentucky for asbestos abatement activities

04.11.10.02.08 Surveillance and Maintenance & Support Activities

Element Milestones:
- Work completed before 8/30/2012.

Element Deliverables:
- Quarterly and annual surveillances as required by Technical Safety Requirements.

WBS 04.11.10.02.09 Uranium Hexafluoride (UF6) System Hazard Stabilization

Element Milestones:
- Work completed before 2/07/2011.

Element Deliverables:
- None.

WBS 04.11.10.02.10 Ammonia (NH3) System Hazard Stabilization

Element Milestones:
- Work completed before 5/02/2011.

Element Deliverables:

- None.

WBS 04.11.10.02.11 Glycol System Hazard Stabilization

Element Milestones:

- Work completed before 4/11/2011.

Element Deliverables:

- None.

WBS 04.11.10.02.12 Vacuum System Hazard Stabilization

Element Milestones:

- Work completed before 11/04/2010.

Element Deliverables:

- None.

WBS 04.11.10.02.13 Electrolytes System Hazard Stabilization

Element Milestones:

- Work completed before 6/07/2010.

Element Deliverables:

- None.

WBS 04.11.10.02.14 Uranium Dioxide (UO2), Uranium Trioxide (UO3), Uranium Tetra fluoride (UF4), & Ash Receiver System Hazard Stabilization

Element Milestones:

- Work completed before 7/07/2011.

Element Deliverables:

- None.

WBS 04.11.10.02.15 Heating, Ventilation, and Air Conditioning (HVAC) System

Element Milestones:

- Work completed before 2/08/2011.

Element Deliverables:

- None.

WBS 04.11.10.02.16 Non-Stationary Materials/Components Removal

Element Milestones:

- Work completed before 10/07/2010.

Element Deliverables:
- None.

WBS 04.11.10.02.17 Alcohol System Removal

Element Milestones:
- Work completed before 4/11/2011.

Element Deliverables:
- None.

WBS 04.11.10.02.18 Prohibited Items Removal

Element Milestones:
- Work completed before 8/18/2011.

Element Deliverables:
- None.

WBS 04.11.10.02.19 Building Decontamination

Element Milestones:
- Work completed before 12/27/2011.

Element Deliverables:
- None.

WBS 04.11.10.02.20 Prepare Building for Demolition

Element Milestones:
- Work completed before 3/30/2012.

Element Deliverables:
- None

WBS 04.11.10.02.21 Building Demolition

Element Milestones:
- Work completed before 7/25/2012.

Element Deliverables:
- Quarterly and annual surveillances as required by Technical Safety Requirements.

WBS 04.11.10.02.22 Post Demolition Activities

Element Milestones:
- Submit D1 Removal Action Completion Report by 12/26/2012.

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

Element Deliverables:

- Revision of SWMU Assessment Reports for SWMUs in the C-410 Complex impacted by D&D activities.
- Removal Action Completion Report.

REQUIREMENTS

- CERCLA/National Contingency Plan
- KY Hazardous Waste Permit (KY8-890-008-982)
- FFA for the Paducah Gaseous Diffusion Plant
- Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah (annual revisions)
- Applicable state and federal laws and regulations (applicable or relevant and appropriate requirements)
- Contractor ISMS
- UEO-1066, as updated - Lease Agreement with DOE and USEC, Revision 4, dated October 30, 2001
- Enclosure to GDP 95-0018, as updated - USEC and DOE Resolution of Shared Site Issues, Revision 1 dated March 30, 1998
- Applicable Contractor plans, policies, and procedures.
- Waste Acceptance Criteria for all applicable treatment and disposal facilities that were in effect on January 1, 2008.
- Applicable DOE Orders
- Applicable Federal Acquisition Regulations

It is the core value of the Contractor that the safety and health of every worker, the public at large, and our environment are the most important assets that we are entrusted to protect. To accomplish this, an ISMS, based on DOE's ISMS, has been implemented that incorporates the five core functions and is based on the eight guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to contractor subcontractors. The five core functions are (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The eight guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, (7) operations authorization, and (8) worker involvement.

SCOPE ASSUMPTIONS

- Based on a review of anticipated conditions, changes in the existing authorization basis for the C-410/420 Complex will be required to complete this work. A change will be required to address the demolition of the facility. The current documentation addresses equipment and infrastructure removal, but does not include analysis of facility demolition.
- The SAP and Waste Management Plan presented in the RAWP developed under element

04.11.03.01.09 will be adequate for all infrastructure removal activities.

- The list of solid waste management units (SWMUs) in the SMP is an accurate representation of the SWMUs that will be monitored under this scope of work. SWMU Assessment Reports (SARs) for units located in the C-410 Complex and impacted by D&D activities will not be updated during D&D activities; an update of the SARs will be included with the Removal Action Completion Report (RACR).
- With exception of the RACR, all regulatory documents are approved as a part of element 04.11.03.01.09 and no additional regulatory deliverables are planned. These document (EE/CA, AM, RAWP) addressing building demolition with non-hazardous infrastructure in place will be approved by the regulatory agencies, superseding existing documents that require removal of all items down to exterior walls and building structure
- D&D operations temporarily will increase the need for S&M during removal operations.
- Historic data collection indicates that none of the building debris or infrastructure waste from the C-410 Complex will meet the Waste Acceptance Criteria for the C-746-U Landfill, due primarily to prevalence of PCB containing paint throughout the facility resulting in classification of waste as PCB Bulk Product, or the levels of radiological contamination exceeding landfill authorized limits.
- Railroad upgrades will be required for local track at the C-410 Complex to allow for staging and loading of High-sided “Super Gondola’s” for waste transport to Energy Solutions.
- Normal non-leased construction equipment (forklifts, manlifts, ½ body monitors, hand tools, etc) used during the demolition will be retained for utilization on future D&D activities.

COMPLETION CRITERIA

The end state for this WBS Element will be as follows:

- Accessible ACM will be abated from equipment and piping in order to remove/minimize this hazard and to access piping and equipment for hazard stabilization.
- Hazardous chemicals (eg. UF6, ammonia, F2, HF, etc) will be removed from process equipment and piping, stabilized, and disposed. The equipment and piping will be removed if any residual material would result in the piping or equipment being prohibited from disposal in a low-level waste landfill.
- Prohibited items (any items such as PCB capacitors, fuses, oil filled gear boxes, mercury filled rectifiers, etc), will be either removed or drained (gearboxes) from in place infrastructure.
- The building will be demolished to slab, in accordance with a to be developed Removal Action Work Plan, Engineering Evaluation and Cost Analysis, and Action Memorandum for structure demolition. Demolition will occur following stabilizing piping and equipment and following prohibited item removal.
- Basements and below grade areas will be filled with grout or other suitable backfill material to prevent accumulation of rain water and to eliminate fall hazards.
- Slabs or concrete foundations which will be either decontaminated or fixative applied to stabilize any removable contamination.
- Wastes generated from infrastructure removal and facility demolition will be disposed of in accordance with appropriate regulatory requirements.
- Where cost effective, equipment or items that may be reused or recycled will be transferred to receiving projects, companies or organizations.
- Complete infrastructure removal, structure demolition, and waste disposal by 12/26/2012.

RISK MANAGEMENT

See Risk Management Plan for analysis.

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

Risk was mitigated through the following efforts:

- Application of lessons learned from other sites, including Portsmouth, Savannah River, East Tennessee Technology Park, Sandia, Georgia Tech Research Reactor D&D, Maine Yankee, and Knolls Atomic Power Laboratory.
- Utilization of integrated work crews and the work force flexibility rules negotiated into the labor agreement to improve workforce effectiveness and flexibility.
- Integration of Waste Management support functions directly into the field project team to ensure near real time disposition of wastes, minimizing double-handling of wastes and minimizing time wastes remain in storage prior to disposition.
- Accelerating removal of loose material (equipment and material that had accumulated in the building) to provide a safer work environment for workforce.
- Focusing efforts on asbestos abatement and hazardous chemical or material removal to eliminate potential hazards to workforce and environment.
- Revising approach to allow for demolition with non-hazardous items and equipment in place, using heavy equipment, rather than manual removal of piping, conduit, and equipment.
- Adjustments to the on-site/off-site disposal ratio have been made in the baseline to account for polychlorinated biphenyls (PCB) bulk product material that originally was assumed to be landfill eligible but with higher radiological contamination than anticipated.

CERCLA AREAS AND SWMU

RAIMS No.	SWMU No.	Description	DMSA No.
	41	C-410-C Neutralization Tank	
	478	C-410/420 Feed Plant	
	494	Ash Receiver Area in C-410/420	
	495	C-410/420 Ash Receiver Shed	
	496	C-410/420 F2 filters in Northeast Mezzanine	
	497	C-410/420 F2 Cell Neutralization Room Vats	
	498	C-410/420 Sump at Column C&D-1&2	
	499	C-410/420 Sump at Column H-9&10	
	500	C-410/420 Sump at Column U-10&1 1	
	501	C-410/420 UF_6 Scale Pit Sumps A&B	
	502	C-410/420 Sump at Column U-9	
	503	C-410/420 Sump at Column G-I	
	504	C-410/420 Sump at Column L-10	
	505	C-410/420 Sump at Column A-3N	
	506	C-410/420 Sump at Column Wa-9	
	507	C-410/420 Condensate Tank Pit	
	508	C-410/420 Settling Basin	
	509	C-4 10/420 Drain pit	
	510	C-410/420 Sump at Column P&Q-2	
	511	C-410/420 Sump at Column Q&R-2	
	512	C-410/420 Sump at Column R-2	
	513	C-411 Cell Maintenance Room Sump	

BASIS OF ESTIMATE

1. Summary of Site Conditions

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

a. Summary

- C-410 is inactive and infrastructure removal work is ongoing in accordance with the approved RAWP. The facility has been subdivided into sectors and zones to facilitate efficient disposition. Known contaminants include low enriched uranium, trace transuranics, beryllium dust, asbestos, and PCBs in paint and, potentially, switchgear components. Some systems are known to contain holdup material that will be rendered passive prior to component/piping removal. The potential that additional chemical and radiological hazards will be identified during infrastructure removal exists. The facility is a Category 2 Nuclear Facility with an approved safety basis authorization for infrastructure removal activities.
- The complex is contaminated with uranium compounds such as uranium oxides, UF_4, and UF_6; heavy metals; asbestos; PCBs; refrigerants; hydrogen fluoride; TRU; and other contaminants. Waste from this facility currently is not being accepted at the C-746-U Landfill. Uranium contamination (greater than 1% by weight of uranium-235) and traces of TRU (from reactor returns) were discovered in the complex. The C-410/420 Complex is classified as a Category 2 Nuclear Facility in accordance with 10 CFR 830 for internal inventory and external criticality concerns. Any known uranium contamination at assays greater than 1% uranium have been removed; therefore there are no known Nuclear Criticality Safety (NCS) items within the C-410/420 Complex; however, NCS concerns could emerge as D&D progresses. Full personal protection equipment (PPE), including respiratory protection, is currently required for entry into the facility.

b. Major Assumptions

- Access to Limited Area is controlled by USEC; building/facility access will be controlled by PRS.
- Regulatory and reporting requirements remain static during the baseline performance period.
- PRS will provide management and technical support staff with all site-required training necessary for access and to perform work on-site.
- Management and technical support staff requiring entry into the Limited Area without escort will require the appropriate security clearances. This WBS element will incur the cost of submitting clearance requests to DOE's Infrastructure and Security Contractor (Swift and Staley). No costs will be incurred in this WBS element for the processing of clearances by Swift and Staley or performance of investigations/evaluations by DOE.
- It is not anticipated that facility air, vacuum, and ventilation systems will require upgrade, or modification, for use by PRS.
- PRS will provide all required S & M support for facilities.
- Schedule will not be impacted by review and approval cycle for demolition EE/CA, AM, and RAWP.
- Asbestos will be shipped in intermodal containers, to Energy Solutions via truck or rail.
- Assume a 35 to 40 day turnaround on leased intermodal containers.
- Mobilization/demobilization charge for leased intermodals $606.25 each with a lease rate of $13/day each.
- Current disposal rate at EnergySolutions of Utah is $16.87/ft3 ($455.49 yd3) for oversize debris.
- Roundtrip transport for intermodals via rail to EnergySolutions of Utah at $14,750 per rail car, with 8 intermodals per car.
- Disposal at the Nevada Test Site (NTS) is planned for building demolition wastes.
- NTS remains direct funded (no per cubic foot tipping fee) for the duration of this project.
- Building debris will be shipped to NTS in intermodals with 768 cubic foot net volume.
- Intermodals rented at $300 per month and shipped at rate of $5,650 per round trip via rail to transfer station, and truck to NTS.
- Liners for intermodals used to facilitate dumping debris at NTS, at rate of $260 each.
- Roundtrip transport to NTS via truck at a cost of $7524.76 per shipment for non-rail shipments.

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

- Waste package certification and field waste technician role will be combined during packaging for NTS disposition.
- All classified waste will be disposed of at NTS @ $13.06/ft3.
- Facility utilities, including electrical power, will be isolated, as necessary, by PRS prior to initiating D&D activities.
- Freon cooling system has been determined by inspection to be at zero inches mercury pressure, which meets the evacuation and recovery standard for this type system. As such, this system is considered stabilized and ready for removal. Removal of this system will occur during the building demolition.
- The production rate for pipe removal used is that found in RS Means, Facilities Construction Data, 20th Annual Edition, 2005. Activity 600-2100 on Page 521 provided a productivity rate of 50 LF per man-day for 4”-6” diameter pipe. All piping was assumed to be within 4”-6” diameter on average.
- Conveyors: No production rate for demolition of conveyors is listed in RS Means. An engineering estimate of 20 to 40 LF of conveyor is removed per man-day was established. The specific rate used varied based on physical dimensions.
- Hoppers: No production rate for hoppers was listed in RS Means. An engineering estimate of 2 to 3 man-days per hopper (based on size) for removal and packaging was established.
- All Other Mechanical Components: An engineering estimate of 18 man-days per piece of equipment was established. (A crew of 3 for 6 days).
- Instrument Lines: Instrument lines associated with each system were considered incidental work associated with that system.
- UF6, UF4 and Ammonia Systems Stabilization: Subcontractor Estimates were used for cost and duration of stabilization of these systems. Equipment removal was estimated on the basis of the assumptions listed above.
- During system stabilization, product removal, system removal, and waste packaging, support personnel will be allocated to the workforce at a ratio of 1 supervisor, 1 radiological control technician, and 1 Safety Technician per 7 workers.
- A revision to the Facility Safety Basis will be developed following hazard stabilization to allow demolition of the facility as a Radiological facility.
- Resolution of USEC Operational concerns for protection of tie lines or other process lines and for CAAS Audibility during demolition preparation and demolition activities around and near the footprint of the C-410 Complex are assumed to not impact schedule or field activities.

2. Estimating Methods

☐ Parametric ☐ Bottom-Up ☒ Other: Planning estimate

3. Sources of Estimating

- This estimate is based on the information provided in the statement of work, reference documents, and interviews conducted with individuals familiar with the condition and current regulatory status of the C-410/420 Complex.
- The basis of estimate for the skill/professional workforce staffing is based on PRS’s experience on projects similar to the C-410 and 420 Infrastructure Removal project such as Maine Yankee and Georgia Technical Research Reactor Decommissioning, Sandia National Laboratories decommissioning projects, and Fernald Waste Pits Remedial Action Program project.
- Travel costs are based on the Federal Travel Regulations (FTR).
- Fuel, Oil, Gas, and Maintenance (FOGM) costs are based on Construction Industry Blue Book rates.

1. PROJECT TITLE/PARTICIPANT	2. DATE	3. IDENTIFICATION SITE
Environmental Management/Paducah Remediation Services, LLC (PRS)	6/18/08	Paducah Project DOE Portsmouth/Paducah Project Office (PPPO)
4. WBS ELEMENT CODE	**5. WBS ELEMENT TITLE**	
04.11.03.01	Out-year D&D of C-410	

- Where Government Furnished Equipment (GFE) is not available, equipment rental costs are Shaw E&I national contract lease rates.
- Material and Other Direct Costs (ODCs) are based on vendor quotes, previous estimate for similar work on the national alliance contract, and equipment cut sheets from manufacturer's catalogs.
- Low value equipment (e.g., small hand tools, etc.) is priced as a multiplier based on personnel direct labor cost.
- Materials and supplies derived from labor estimate and types of maintenance activities required.

4. Basis of Estimate (Unescalated Values)

WASTE VOLUMES

See attached waste performance metrics, as applicable.

PROJECT SCHEDULE

See attached schedule.

BASELINE BY YEAR

See attached Baseline by Year Report.